Digital DIY – Communities

Welcome to Digital DIY and Communities

This module has the following learning objectives:
1. *Getting to know some of the most important online DiDIY communities and what they can offer both to individual DiDIY practitioners and to society as a whole;*
2. *Understanding the role and need of such online communities, and of Internet-enabled communication in general, in the growth and usefulness of DiDIY.*

INTRODUCTION

In this module we shortly introduce, in alphabetical order, some online DiDIY communities of different kinds. Some are specialised, that is cover only one specific kind of DiDIY application. Others are instead focused on one or more DiDIY technology, like 3D printing or laser cutting, regardless of its application. Both kinds of communities, however, already count thousands of participants and constitute resources that cannot be ignored by whoever wanted to practice the same activities. Let's have a look at these communities and examine their common characteristics.

FOCUS

Citizen Sensor

Citizen Sensor (http://citizensensor.cc/) is, or rather was, a community using DiDIY for environmental monitoring and pollution control. While the project seems to have stopped in 2012, it is a worthwhile example of (collective) DiDIY applied to public service. All members of the Citizen Sensor initiative, in fact, are equipped with a DIY, wearable, reconfigurable sensor pack. "Reconfigurable" means that the actual sensors are interchangeable "plug and play" accessories of the basic pack. Participants can choose when and where to bring it with them, to collect, share, and understand pollution-related data like air concentration of methane and carbon monoxide, or noise pollution.

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DIY Drones

Most people may know that small civilian "Unmanned Aerial Vehicles" (UAV), usually called drones, have become so popular that several countries have had to issue regulations limiting where they can fly or create drone driving licences. What may be less known is that it is possible to co-design and build almost from scratch many types of drones. The reference community for this specific DiDIY activity is DIYDrones (http://diydrones.com/), which counts several tens of thousands of members. DIYDrones defines itself as "the home of ArduPilot Mega (APM)", which, as shown in the picture, is a DIY software and hardware autopilot platform usable for model planes, multicopters, unmanned ground vehicles and many other devices.
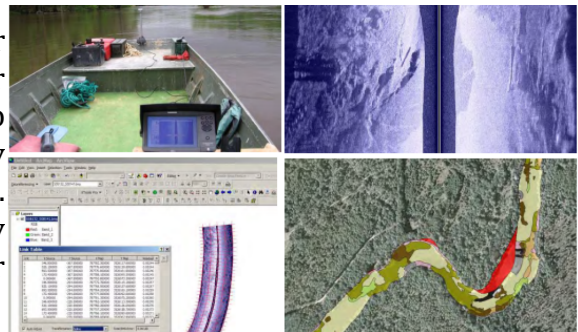
FOCUS

EnviroDIY

The EnviroDIY community (http://envirodiy.org) operates in the same field as the "Citizen Sensor" project, but is still very active and has a much larger scope: sharing ideas and experiences about Open Source hardware and software solutions for environmental monitoring. The long-term goal of EnviroDIY is to foster *"an explosion of high-quality real-time data that transforms the practice of environmental science, resource monitoring and watershed protection".* An example of the latter application is this "side scan" sonar system for mapping the bottom of rivers and lakes (http://envirodiy.org/side-scan-sonar-towards-a-low-cost-benthic-mapping-tool):

All EnviroDIY members are invited to publish their own home-grown approaches to monitoring, sensor calibration, installation hardware, radio communication, data management, training or any number of other topics on the community website. Sometimes, members also team up to collectively develop new devices or write documentation for existing ones.

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OpenBuilds

Compared with other portals described in this module, OpenBuilds (http://openbuilds.org) is more of a generalist website. Its slogan is "Dream It – Build It – Share It". The website is

partitioned into semi-independent sections dedicated to 3D printing, but also to CNC, laser cutting, drawing with robots and further technologies described in other modules of this course. Users can showcase their projects and products in the "Gallery" section, or buy parts for a particular project from the integrated online store. Other sections are devoted to tutorials and archives of software useful for DiDIY design. The practical applications include activities like mounting side sonars to kayaks in order to make 3D scans and digital maps of bodies of water.
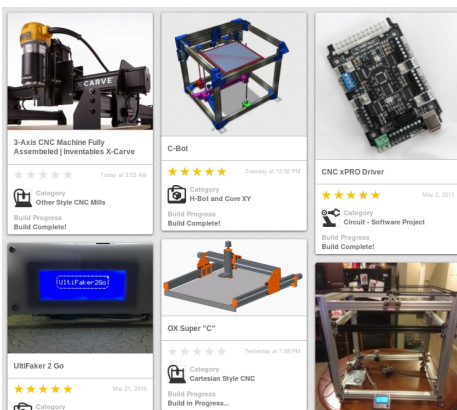
FOCUS

OpenCores

OpenCores (http://opencores.org) is the world's largest site/community for development of Open Source designs of reusable modules (cores) for digital integrated circuits. Participants to OpenCores can upload, share, discuss and co-develop designs of functional blocks like Ethernet or USB controllers, mathematical processors, memories, or encryption circuits. The very small board shown in the picture, for example, has been designed by OpenCore members and can perform custom data processing for any application, thanks to the included FPGA and microcontroller..

FOCUS

Opendesk

Opendesk (www.opendesk.cc/open-making) calls itself "a global platform for local making", whose field of interest is furniture and workspaces. Opendesk is primarily an online platform connecting end users (of furniture) to designers and makers. In other words, through Opendesk designers and makers can work together to produce, customise and share new designs. "End users" (people who need furniture, but do not have the time or skills to manufacture it by themselves) on the other hand, can buy or order it directly from those designers and makers.

Breakout Table

Lift Standing Desk

Fin Lockers

Fin Bookshelf

FOCUS

OpenWeatherMap

OpenWeatherMap (http://openweathermap.org) is a Web platform that delivers over one billion forecasts per day. The raw data used to generate these forecasts are voluntarily contributed, in the same spirit as with OpenStreetMap or Wikipedia, by people or organisations who run their own weather station in any part of the world. Access is also open to builders and operators of private DiDIY weather stations. They may automatically upload data from their stations to the website, and may even embed the generated weather forecast in their home page.

It is this open DiDIY approach that, as of March 2016, allows OpenWeatherMap to provide open weather data for more than 200,000 cities, in an easily usable format as shown in this chart:
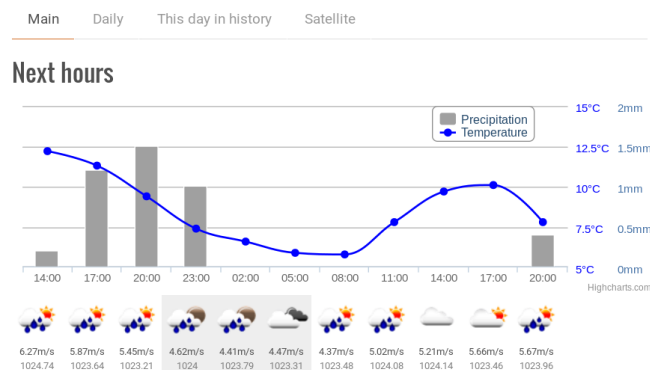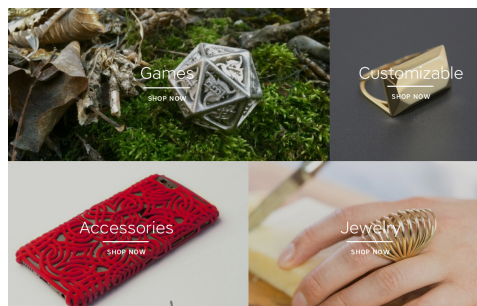

FOCUS

Shapeways

Shapeways (www.shapeways.com) is a combination of social network and marketplace focused on 3D printing of everything from jewelry to toys and home accessories. The website offers support to co-design custom products, and to produce, sell or buy them. A mobile app to design or customise 3D printed objects is also available. Once a design is ready, it is possible to have a copy produced and shipped on demand, by Shapeways or its partners. Users who want to sell their products can set up their own online shop inside the website.


FOCUS

Thingiverse

Thingiverse (http://www.thingiverse.com) is the largest online community specifically

devoted to sharing of 3D printing designs, which as of March 2016 declares over 500 thousand registered users. All these users, as well as website visitors, can browse the website to find design files ready to be loaded into their 3D printer, or to be customised as they want. As with 'normal' social network platforms, it is possible to follow particular users to know which designs they share, like them, participate in discussions within several groups or create collections according to one's personal interests, as in this example: a collection of spare parts and accessories for Mercedes cars. Users are also encouraged to show their skills by participating in periodic challenges.
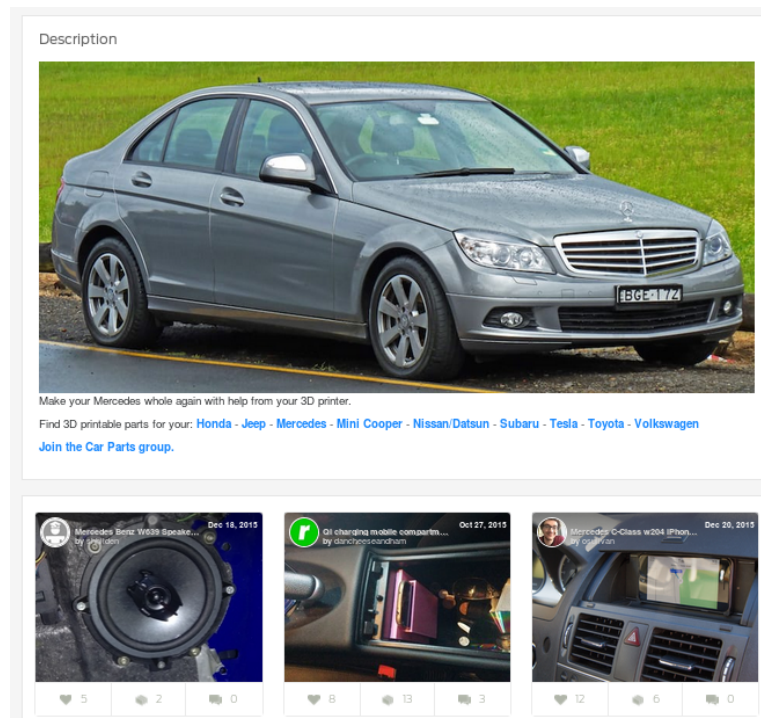
CONCLUSION

The one element that all these communities have in common is that, obviously, they could not exist without the Internet: first of all, non-digital communications would be much slower and would greatly discourage cooperation. Even more important is the fact that without digital networks it would not be possible (at least not regularly and not on a meaningful scale) to exchange *complete, 100% perfect copies* of designs or the command files needed to configure DiDIY devices like 3D printers.

Looking at these communities also makes it easy to understand one fundamental characteristic of DiDIY: This phenomenon only has grown so much and holds so much potential because it is heavily based on open technologies on one side and *cooperation* on the other. In practice, this cooperation is often not exactly mutual, because many people just use the existing designs of others instead of actively contributing to the design of new projects. Still, without cooperation, rapid learning and progress with products as complex as microcontrollers and 3D printers would be exceedingly slower and in many cases would simply not happen. It is for this reason that Digital DIY could be, and maybe should be called "Digital DIWO", that is "Digital Do It With OTHERS".

FURTHER RESOURCES

Articles:

"Terms and Conditions for Participation in EnviroDIY" http://envirodiy.org/member-guidelines/

A newbie's guide to Unmanned Aerial Vehicles (UAVs) - http://diydrones.com/profiles/blogs/a-newbies-guide-to-uavs

A Smart Open Design Startup is Born: OpenDesk - http://makingsociety.com/2013/08/a-smart-open-design-startup-is-born-opendesk/

OpenDesk.cc Is Like Ikea For Open Source Zealots - http://techcrunch.com/2013/08/18/opendesk-cc-is-like-ikea-for-open-source-zealots/

Shapeways vs. Thingiverse - http://www.inside3dp.com/shapeways-v-thingiverse/

Shapeways vs. Thingiverse: An Exclusive In-Depth Web Traffic Analysis - http://www.inside3dp.com/shapeways-vs-thingiverse-exclusive-depth-analysis

LEARNING ACTIVITIES

You may choose the activities that you like the most, although we recommend that you try everything. Please document each of your chosen activities and publish your documentations in the appropriate location, so peers can access them and contribute feedback.

Choose at least two of the communities described there, subscribe to them and:

- report about its main features and code of conduct
- describe how it is organized and, above all, how it helps beginners: is there custom documentation for them? Moderators or other members who are specifically assigned to help newcomers? Are products classified or graded in ways that make it easy to find out which ones are easier to produce personally?
- choose one of the products created or shared inside the community, and find out and describe how much would it cost for **you** to manufacture

DiDIY
DIGITAL